EFFECT OF FINANCING INSTRUMENTS ON IMPLEMENTATION OF GEOTHERMAL ENERGY PROJECTS IN KENYA. CASE OF GDC MENENGAI GEOTHERMAL PROJECT

BY

SANDRA C. SOY

UNITED STATES INTERNATIONAL UNIVERSITY- AFRICA

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SANDRA C. SOY

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SUMMER 2018
STUDENT’S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University for academic credit.

Signed: ___________________________    Date: ___________________________
Sandra C. Soy
ID NO: 629029

This project has been presented for examination with my approval as the appointed supervisor.

Signed: ___________________________    Date: ___________________________
Mr. Kepha Oyaro

Signed: ___________________________    Date: ___________________________
Dean, Chandaria School of Business
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ABSTRACT

The purpose of this study was to examine the effect of financing instruments on implementation of geothermal energy projects in Kenya; the case of GDC Menengai geothermal energy project. The researcher used the following research objectives to guide the study to its completion: To establish the effect of debt financing on implementation of geothermal energy projects in Kenya.; To examine the effect of equity financing on implementation of geothermal energy projects in Kenya; To determine the effect of donor financing on implementation of geothermal energy projects in Kenya; To establish the effect of public private partnership on geothermal energy projects in Kenya.

The target population for this study included employees that worked for GDC especially those that worked in Projects Management, Planning and Strategy, Finance and Corporate Performance Management Departments. A stratified sampling technique was adopted to pick the respondents from their respective departments. The sample size was 284 respondents. Data was collected using self-administered questionnaires and descriptive statistics was applied for data analysis.

The first research objective revealed that debt financing was a cheaper source of financing geothermal projects and to large extent improved efficiency in the implementation of geothermal energy projects. The second research objective established that a large extent of the respondents agreed that equity financing enabled the organization to easily get loans in future. The third research objective established that to a large extent that donor funding allowed donor influence on project decisions, delayed project implementation and limited project scope. The fourth research objective established that a moderate extent of the respondents agreed that stakeholders participated in project decisions and that GDC abided with regulations. The results were presented in form of charts and tables. Content analysis was utilized in analysing qualitative form of data.

The study concluded that the most popular financing instruments used by GDC are debt and equity. These sources of finance have less bureaucracy or no bureaucracy at all, they allow the organization to enjoy full control of the project decisions and they do not limit the scope of geothermal energy projects.

The study recommends firstly that an organization can consider use of debt to boost their investment returns and to benefit from interest deductions as long as the debt does not threaten the financial health of the organization. Secondly, the study recommends that GDC
should consider using internal funds to finance their projects if these funds are available. Use of internal funds allows the organization to have complete control of its business unlike diluting control to other investors whose interests might be different from organizational goals. Thirdly the study recommends that the government looks into the use of private public partnerships as a different source of financing for geothermal projects. Lastly, the study recommends that the government needs to organize and create proper channels on how to understand and appreciate donor funding procedures available.

A suggestion for further research recommended that studies be carried out on other financial factors influencing the implementation of geothermal projects and growth of the Geothermal Development Company in Kenya. It is also recommendable to conduct studies on the implication of other forms of loans (short-term and medium-term loans) on the growth of GDC. The study also recommends a comparative empirical study to be conducted on the influence of both local and international financing on the growth of the GDC. A similar study should also be conducted on the effect of debt, equity and donor funds on the implementation of geothermal projects and growth of the GDC.
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<td>ERC</td>
<td>Energy Regulatory Commission</td>
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<td>GDC</td>
<td>Geothermal Development Company</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>MGDs</td>
<td>Millennium Development Goals</td>
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<td>PPP</td>
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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Traditionally, the government finances infrastructure investments through public funds. Among the reasons for government involvement in funding public infrastructure, include the fact that it is a public good by nature, and the positive externalities it generates (Inderst & Stewart, 2014). Despite the commitment of the government to fund public infrastructure, it is difficult at times due to factors such as high public debt to GDP ratio and low investment spending in the public sector. In some cases, governments resort to budgetary pressures aimed at repairing the balance sheet and rebuilding liquidity buffers and capital. For a given government to finance the public infrastructure effectively it is crucial to develop alternative methods of financing. In light of this, governments seek the option of financing public infrastructure through institutional investors (Weber & Alfen, 2010).

Nassr and Wehinger (2015) argue that the primary reason for using the financing method is the long-term nature of liabilities by the institutional investors. However, funding public infrastructure through institutional investors is challenging because of their lack of knowledge and experience on infrastructure investments. World Bank (2011), presently, the institutions allocate little proportion of their investments to infrastructure assets. The institutional investors are used to investing in public infrastructure through other methods such as fixed income instruments thus are unfamiliar with direct investment in public infrastructure.

In effort to meet the financial demands of public infrastructure, plans are underway to establish new and more effective financial instruments. So far, the efforts seem to be productive, for example, equity market for public infrastructure is promising. Further, the liquid market for bonds is slowly replacing the syndicate loans used in project finance. Under proper management, bank loans can offer an effective method of financing for public infrastructure through securitization. The process enhances the development of market capital instruments that are transparent and diversifies risks faced by banks. Majority of institutional investors do not have appropriate financing infrastructures, a fact that limits their investment in public infrastructure (Rothballer et al., 2012).
Inderst (2010) contends that the lack of appropriate financing structure makes the institutions inefficient in funding large projects. For example, smaller pension funds require collective investments, which are highly expensive. However, developments in the public finance sector are underway to address the issues facing infrastructure financing. Various unlisted equity funds in the market offer long-term financing that appeal to public infrastructure financing. Private financing is a challenge when funding public infrastructure due to large information asymmetry that affects decision making by the involved parties. Further, the long-term nature of public investments implies higher risk by the private financiers due to uncertainty of the market. Owing to the high demand for public infrastructure financing, it is crucial for governments to attract more financiers. One of the most effective ways of attracting the investor institutions is by presenting infrastructure assets as attractive investment opportunities. The risk-return profiles also need to be considered in attracting the institutions; they should match the needs of the investors. Projects that are unequivocally viable attract investors and enable the government to meet its public infrastructure financing needs. The private sector does not invest in projects whose return is not proportional to the risk. To attract the investors, it is crucial to employ techniques that improve the rate of return on investments (World Bank, 2011).

Equity investors experience asset-specific risks because the investees do not offer any security. This implies that the rate of return for the investment is determined by the implementation of the assets. Investors resort to risk-sharing measures through methods such as PPPs, long-term leases, and concessions. The project sponsors also play a significant role by contributing to equity; the contribution is useful in initiating projects. Weber and Alfen (2010) explain that project sponsors act as bidders for public sector tenders in cases of public-private partnership (PPP) structures. There are also financial sponsors, who contribute greatly to the success of a project. Their difference with the project sponsors concerns the involvement in the asset management. Kraemer-Eis, Schaber and Tappi (2010) note that project sponsors are actively involved in managing the assets while financial sponsors only play part in capital contribution. The proportion of equity in project finance is about 10 to 30 percent, but the amount varies with economic stability. During credit crisis, the creditors may request for an increment in the proportion.
Beeferman and Wain (2012) explain that infrastructure projects sponsors accept higher debt levels for infrastructure projects, which have greater advantage than infrastructure investments. However, there are some instances where projects are financed fully through debt instruments, for example, Skye Bridge and Second Severn crossings in the United Kingdom (Sawant, 2010). In such cases, the lenders manage assets fully because they own the capital. The merits of infrastructure projects over infrastructure investments are due to low operating risks (Moody’s, 2015). Various debt instruments can be used in public finance including tranching of issues, covenants, and collateralization. The most crucial aspect is to ensure that the instruments match the credit needs of the investors. To minimize effects of currency mismatch, most of the project finance transactions are conducted in local currencies. However, it is also possible to have hard currency issuance.

Kenya requires to raise estimated 18 billion US dollars to finance Geothermal energy projects that can generate 5000Mw being part of the vision 2030. The various forms of financing options available for Geothermal energy projects can be grouped into three; debt, equity and financial leverage. Therefore this study seeks to establish the effect of aforementioned financial instruments on implementation of Geothermal Energy projects. The Menengai Geothermal Development Project lies in the Eastern Sector of African Rift System that is 180km North-west of Nairobi, Kenya. This project is intended to cater for the rising demand for power while diversifying power supply sources by developing the country’s geothermal potential in line with Kenya’s vision 2030. This project also seeks to develop Menengai geothermal steam field in order to produce sufficient steam for 400 MW power which will be produced by the private sector as Independent Power Producers (IPP), this project was set to complete last year will an estimated budget of USD 746 million however, it is still going on to date.

1.2 Statement of the Problem

The financial services make a huge contribution to the modern economy through mobilizing funds from savers and investors and channelling these funds to trade and business. Through classification of financing instruments gives alternative investments available to public and private sectors to invest in infrastructure. To identify appropriate financing instruments, firms must consider various forms of debt and equity and risk reduction tools deployed by government and agents (Kraemer-Eis & Tappi, 2010). This is aimed at identifying innovative
financing instruments and risk minimization approaches adopted to finance infrastructure assets. Rothballer and Kaserer (2012) argue that identifying an affective financing approach, instruments and vehicles can broaden financing options for infrastructure projects, diversify the investor base and lower funding cost for infrastructure projects. Sawant (2010) posits that identifying the range of incentives and risk minimization tools, for both public and private that can foster mobilization of financing for infrastructure in particular those linked to reduction of commercial risks.

Kenya has started the process of achieving 5000 Mw which is line with Vision 2030. This is set to be achieved the next 20 years which will translate to installing about 250 MW extra capacity of geothermal electric power annually, drilling 60 well and operating a minimum 12 rigs in the next 20 years (Combs, 2006). Therefore, Kenya needs to raise at least 18 billion US$ to realize this goal. The ability of a project to generate adequate revenues not only to meet their operational need but also to realize debt repayment and attractive return on investment to the stakeholders (investors) is critical in financing Geothermal energy Projects (Kenya Ministry of Energy, 2011).

Therefore, this study finds it worth to investigate the effect of financing instruments utilized by Geothermal Development Company (GDC) and how they impact on implementation of geothermal projects. Nwude, Itiri and Agbadua (2016) did an examination involving debt structure and performance of geothermal energy projects in Nigeria and the results showed an inverse connection between debt structure and performance. Otengei, Kasekendi and Ntayi (2015) explored the link between donor funding and implementation of community water and sanitation projects in Uganda and the results showed that donor funding slowed down implementation of water and sanitation projects.

In Kenya, Stella (2015) did an investigation on the effect of funding of PPP projects on infrastructural development of Thika road and it was concluded that PPP funding impacted positively on infrastructural development projects. The studies above are not conclusive on the effect of financing instruments on implementation of projects. The combinations of variables of financing instruments are also not the same and so are the firms under study. This study proposes to focus on the geothermal energy projects focusing on GDC Menengai geothermal project in Kenya.
1.3 Purpose of the Study
The purpose of this study was to establish the effect of financing instruments on implementation of Geothermal Energy Projects in Kenya; Case of GDC Menengai Geothermal Project.

1.4 Research Objectives
1.4.1 To establish the effect of debt financing on implementation of geothermal energy projects in Kenya.
1.4.2 To examine the effect of equity financing on implementation of geothermal energy projects in Kenya.
1.4.3 To determine the effect of donor financing on implementation of geothermal energy projects in Kenya.
1.4.4 To establish the effect of public private partnership on geothermal energy projects in Kenya.

1.5 Significance of the Study
1.5.1 Management of GDC
The study has the following practical values: the management of GDC will understand the most appropriate sources of financing to use in financing geothermal energy Projects. They will also understand the role of financing instruments and their impact on Geothermal energy Projects. The management will be informed on the extent to which financing instruments should be adopted at GDC.

1.5.2 Policy Makers
The policy value of this study is that it provides the regulators; Energy Regulatory Commission with a better understanding of some of the best practices that can be applied to facilitate policy formulation.

1.5.3 Academically
This study will add to the current body of knowledge on the effect of financing instruments on project implementation. To scholars and researchers, the findings obtained in this study will provide a basis for further research in the area of financing instruments.
1.6 Scope of the Study
The study focused on Geothermal Development Company that is currently based in Kenya. The study sought to understand the effects of various financing instruments on geothermal energy projects and their contribution towards project implementation. Primary data was collected using questionnaires. Purposeful sampling was used to select 30 senior employees in finance, planning and operations departments who were directly involved financing and implementing of geothermal energy projects.

1.7 Definition of Terms
1.7.1 Geothermal energy
It is a form of energy conversion in which heat energy from within earth is captured and harnessed for cooking, bathing, space heating, electrical power generation and other uses. For this case study, we refer to electrical power generation. (Akrami, 2017)

1.7.2 Donor funding
This refers to funding that is non-repayable or a product which is given by one party who in this case is the donor. This donor could be a government department, a foundation or a company. (Katsuya et al, 2015)

1.7.3 PPP
Public Private Partnership is a long term contract between a government entity and a private party for providing a public asset or service in which the private party bears significant risk and management responsibility and remuneration is linked to performance.(Mwangi, 2010)

1.8 Chapter Summary
The chapter presents the background on effects of financing instruments on implementation of Geothermal Projects in Kenya. The chapter is divided into the following sections: the introduction, background of the problem, statement of the problem, purpose of the study, research questions, significance of the study, scope of the study and definition of terms. Chapter two will present an overview of the literature reviewed according to the research objectives.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The chapter provides a detailed coverage of the literature for this study. It covers the main modes of financing projects and their effect on implementation of projects. Scholars have put-forth various arguments concerning the various approaches that governments in different countries fund public projects to enhance infrastructural development and economic growth. When the governments intend to finance projects, key decisions has to be made on the mode of financing between debt and equity which is also referred to as capital structure. Capital structure can be described as the manner in which a firm finances its assets through a blend of equity and debt. There are various forms of financing public projects however; the main ones include use of debt and equity. Other financial instruments that have been discussed include donor funding and public private partnership and how they affect project implementation. When financing projects, capital structure is one of the most important decisions made a by a firm since it has an effect on the implementation of projects.

2.2 Debt Financing on Project Implementation

Debt structure consists of short-term debt and long-term debt. Short-term debt is a kind of debt whose matures in a period of one year or less and is recorded as a current liability in the balance sheet of a firm. Long-term debt is a financial compulsion whose maturity exceeds one year. For example bonds. Debt financing is a key element of external financing for institutions seeking to raise extra finances for investment. Debt financing accrues several advantages and disadvantages. Fama and French (2002), indicate that some of the benefits of debt financing include tax deduction. However, there are costs associated with debt financing that include bankruptcy costs and agency costs. Syndicates offer loans offered by commercial or development banks by selling them directly to the investors through loan markets or co-investment contracts with large institutions.
In the banking sector, the institutions underwrite infrastructure loans and finance them from the beginning to the maturation of the project. Some banks offer loans to other financial institutions to increase their reach to the consumers (Weber and Alfen, 2010). Firms use project finance loans during the operational phase or construction stage of a project. One of the primary benefits of the project finance loans is their higher flexibility compared to other financing options such as bonds. Unlike bonds, the investor can choose loan repayment terms, structure, and coupons that reflect the requirements of the project over time. Investors prefer bank loans because of the ease with which they are accessible. The loans have the lowest level of risk and businesses use collateral to secure them. The amount of bank loan that the investors qualify is determined by the liquidation value of the asset used as collateral and the ability of the project to generate adequate cash flow to finance the loan. For asset-based debts, the implementation of loans is critical to servicing the debt, implying that the structure of the debt depends on the implementation of the asset. This is not the case with unsecured corporate bonds, whose structure is determined by the borrower’s ability to meet the required payment obligation. Sawant (2010) explain that debt restructuring for the loan syndicates is cheaper and quicker because of the high concentration of creditors who diffuse bondholders.

2.2.1 Long-term Debt and Project Implementation

A descriptive study was conducted in Ghana using a simple regression, Antwi (2012) revealed that long-term debt was positively linked to ROA, the more firms utilized debt, and the more they reported positive performances. Aliakbar (2012) explored the effect that long-term debt financing had on corporate performance. The aim of this research was doing a comparison of small and large firms listed under Tehran securities exchange and it was discovered that use of long-term was significantly linked to ROA. Nirajini and Priya (2013) established that use of leverage was significantly linked to project performance in Sri Lanka. After exploring 100 listed firms at New Zealand Stock Exchange, Smith (2012) showed that leverage was significantly linked to growth in sales and cost reduction.

Akhtar (2012) investigated the link between long-term debt and financial performance and the results showed that a positive correlation amide leverage and overall financial performance of listed firms. Syed (2013) did a study in Pakistan on the link between leverage and financial performance and the findings showed a positive connection between leverage
and ROA. Nikoo (2012) delved the link between long-term debts on bank performance, a descriptive design was employed in a sample of 17 banks in a period spanning for 6 years. It was argued that while debt finance was a way of increasing firm investment, it recorded a significant and negative effect on firm performance. Ikapel and Kajirwa (2017) did an empirical investigation on the link amid long-term debt on financial performance of state sugar firms in Kenya and the findings showed that long-term debt was negatively linked to ROA. An inverse relationship was further established amid long-term debt and ROA.

Majumdar and Chhibber (2009) and Mahakud and Misra (2009), studies were carried out in India, and the results showed that leverage had a negative effect on project implementation due to high interest burden and agency costs. Most public projects that were funded using debts turned out to be very expensive since the costs of servicing the debt exceeded the returns that were got from the projects. Majumdar (2007) tested the link between debt financing and financial performance of Indian capital markets whereby lending firms were government-owned. It was revealed that financial performance of the leveraged firms decreased as a result of conflicts between shareholders and debt holders since high leveraged firms lost significant market share to their low leveraged competitors during industry downturns (Opler & Titman, 2011).

Fama and French (2002) found that debt financing had an inverse effect on financial implementation since there lacked tax benefit of debt because of agency problems. Some studies show existence of a positive relationship between long-term debt and implementation; Baker (2012) found that greater use of leverage is an indication of high risks that results into increased profitability. Ross (1977) found that a positive correlation between long-term debt financing and project implementation. Graham (2012) found that debt tax benefits, firms that had high marginal tax rates were more likely to issue debt as compared to firms with low tax rates.

Nwude, Itiri and Agbadua (2016) examine the impact of debt structure on performance of projects in geothermal energy projects in Nigeria. Panel data for a duration spanning for 12 years (2001-2012) was utilized and a cross-sectional survey was adopted. Study population included 10 firms that were involved in generating geothermal energy. Data was extracted from annual reports of sampled firms in Nigerian Stock Exchange. A regression equation was employed to establish the relationship between variables. An inverse relationship was found to exist between long-term debt structure and performance. As such, this study agrees with
the pecking order theory. Olu (2013) delved the impact of debt financing on successful implementation of community projects in Nigeria. An exploratory study design was utilized. The sample size included 95 project managers and coordinators. Questionnaires were used to collect primary data and a regression model was used for analysis. The results showed that long-term debt was negatively related to community project implementation.

Dube (2013) explored the effect of debt financing on financing SMEs operations. A survey research design was adopted and quantitative and qualitative forms of research were employed. Descriptive statistics and a regression equation were employed in data analysis. The results showed that long-term improved efficiency of SMEs operations and productivity. It was also discovered that the cost of borrowing was too high and this limited SMEs from adequate borrowing.

Ngugi (2012) investigates the link between financing structure and implementation of geothermal energy projects. The study pointed out that geothermal project required a huge capital investment for implementation. Raising this kind of money is not easy from an organisation’s internal sources. Hence, an argument was drawn that use of debt was much cheaper as compared to equity. In addition, the study findings revealed that most organisations preferred to lower their risk profile in a project through adoption of project finance where financial institutions especially creditors were requested to share profits and accept the risks involved in the project. The researcher indicated that interest that arose from long-term debts was treated as a deductible expense for income tax. This gave the organisation price advantage that is also referred to as tax shield.

2.2.2 Short-term Debt and Project Implementation

Chandra (2014) surveyed the contribution of debt financing on project implementation in India and the results showed that debt was the cheapest source of financing. It was an efficient source of financing since banks took a limited time to make approval. Use of short-term debt as a financing tool allowed the borrowing firm to make control over decisions. Under this form of financing, the organisation worked harder to pay the principle and the interest amounts. It was concluded that use of short-term debt financial instrument contributed towards successful project implementation. In addition, a study carried out in Turkey by Choi (2014) did an analysis of the cheapest and efficient sources of financing global geothermal development plan and the results showed that equity and debt were the cheapest sources of financing geothermal energy projects. Some of the reasons highlighted
for use of these financing sources were as follows: the organisation benefits from tax deductions of debt interest, the organisation maintains control in decisions and activities of the project, use of short-term debt was less bureaucratic in disbursement of funds and there is no restraint on the scope of the project.

Mwangi (2012) evaluated the effect of financial structure on firms’ financial performance of listed firms at NSE and the findings showed a positive link amid short-term debt financing and ROA. Salazar (2012) pointed that loans recorded short-term maturity and this assisted firms to accomplish their financial needs at a minimized financial costs and thus improved firm growth and profitability a significant relationship was found amid short-term debt and ROA. Weinraub and Visscher (2013) delved on the link amid short-term debt and financial performance and the results showed that short-term debt was positively linked to firm’s profitability, it was further showed that short-term debt was positively linked to asset tangibility. The firms lacked collateral was not in a position to acquire long-term debt finance.

2.3 Equity Financing on Project Implementation

2.3.1 Internal Generated Funds

According to Graham (2012) firms have different methods of raising capital, including equity finance that entails exchanging ownership interest for financial resources. This kind of financing allows investors to dispose their securities in the market or asset proceeds. Equity financing is crucial to the success of a business because it provides low risk capital that fund infrastructure investments. The investors have the option of selecting listed shares or unlisted shares. Verhoest, Petersen and Scherrer (2014) contend that the primary aim of equity investors is maximizing the return generated by equity. In cases where they invest in infrastructure, maximization of yield on dividend is the most suitable way of meeting the objectives. Concerning risk of the project, equity investors bear asset-specific risk because the investee does not offer any security. The primary focus of the investors during financial distress is achieving leverage effect that increases the return on capital. According to Weber and Alfen (2010), project sponsors who contribute equity fund initiation of a project. The project sponsors also play a significant role in promoting the company’s efficiency in using its resources by engaging in managerial activities. Verhoest et al. (2014) posit that risk management is among the reasons that motivate investors to opt for equity financing. The
method of financing is suitable for investments with the high risk-return profile such as technological innovations; other modes of financing such as debt financing may be unavailable for high-risk projects due to the high uncertainty of returns. Equity finance is either in the form of public equity or private equity.

In the former, investors act as minority shareholders but the case is different for the private equity; the investors are actively involved in decision making because they are major shareholders (Vecchi, Casalini & Gatti, 2015). Margaritis and Psillaki (2010) explored 113 Greek public firms. The study showed that equity finances sources did not have a significant effect on project value. Project implementation was measured in terms of time, cost and quality. Use of internally generated funds was found not to be necessarily profitable. These findings are inconsistent to the observation made by Richardson and Sloan (2009) who revealed that cash from newly allotted securities enabled firms to exhibit a faster growth compared to internally generated funds.

Sciascia and Mazzola (2009) explored 317 Italian public firms; it was found that firms that attained a high proportion of external equity recorded better implementations. A study by Mwangi, Makau and Kosimbel (2014) found a significant link between equity structure and ROE. Muigai (2016) tested the link between capital structure and implementation of infrastructure development projects and found that equity structure was significantly linked to implementation of infrastructural development projects.

Gichuhi (2016) concluded that use of internally generated funds was a cheaper means of financing government projects. Kinuthia (2012) studied the contribution of equity financing on successful implementation of community water and sanitation projects. A correlational kind of a research design was adopted. Samples of 50 project implementers were interviewed and primary data was gathered using questionnaires and interview guides. Descriptive statistics and a regression analysis were used and it was established that equity financing was positively related to implementation of community water and sanitation projects.

2.4 Donor Funding on Project Implementation

Donor funding is funding that is non-repayable or a product which is given by one party who is in this case is the donor. This donor could be a government department, a foundation or a company to a recipient who in most cases is a non-profit making organisation or a business. So as to get funds, the institution seeking for funds should do writing which is known as a proposal.
Funds are meant to fund certain projects that call for some level of compliance and reporting. The process of sourcing for funds include submission of a proposal by an applicant to a potential funder, either through an applicant’s own initiative or in reply to a request for a proposal from the funder. Some funds could be given to individuals to open small businesses or governments for financing public projects.

Wachira (2012) explored those financial plans that were set by Kenya government to facilitate geothermal development. It was disclosed that the government and lending institutions could provide grants to a given project, concessional finance or at commercial rates that also contrast from one institution to the other. Empirical results depict that Kenya as one of the six pilot countries identified to benefit from the Scaling-Up Renewable Energy Program (SREP) in low income economies; SREP operates under Climate Investment Funds (CIF) that is funded through various contributions from bilateral development partners, the development regarding the department for International Development (FID) and Netherlands government being the key contributors. The African Development Bank (AfDB) and World Bank Group (WBG) as well as international Finance Corporation (IFC) work together in managing the SREP programs in Kenya. World Bank is the lead institution for Kenya SREP whose goal is piloting and demonstrating the social, economic and environmental feasibility of a low carbon development pathway in the energy sector through generating new economic prospects and enhancing energy access through the use of renewable energy (CIF, 2011).

A comparative research was conducted by Sanyal, Tait, Jayawardera, Hutter and Berman (2016) to analyze the methods to mitigate geothermal resource risk. It was observed that geothermal risk mitigation funds (GRMF) which is a first multi-donor scheme supported geothermal risk mitigation in Africa. Based on the findings, this facility provided competent public and private developers who had grants for surface studies, and cost sharing for exploration form of drilling. This research found that qualified developers received up to 40% of the total costs up to 2 exploration wells, and an additional 20% cost of related infrastructure. To successfully participate in the exploration and subsequent field development, project developers can get an additional 30% predetermined cost of well exploration as a premium. As established by the study, developers could apply once annually for grant funding from the GRMF and then their applications could be assessed against set predetermined financial and technical criteria. It was unravelled that the beneficiaries of GRMF included four projects in Kenya and Ethiopia that got funding during the first-call for proposals that were made in December, 2012 that are presently in the exploration phase. The
study demonstrated that funding could be mobilized for geothermal exploration through minimising the cost shared with the public sector.

Micale and Oliver (2015) delved the effect of grant financing on implementation of geothermal projects in developing countries. The findings showed that grants or contingent grants from the government and development finance institutions could be utilized to cover costs related to preliminary surveys and surface examination or to mitigate exploration drilling risks for private developers. It was discovered that grants which were cost free funds were very limited.

Although there were various institutions that provided grants, these funds were restricted to less than 2 million Euros and did not exceed 5 million euros particularly in funding energy projects. It was also revealed that grants were limited in their application in that the financing institution dictated the use of the funds. Most of these funds were specifically and exclusively meant for capacity development, technical support in studies and providing training for specialized skills. The process of applying grants was very intensive and this attracted competition thus limiting the chances of obtaining these grants.

Gachui (2017) did an investigation regarding the effect of donor funding towards successful implementation of community development project and the results disclosed that donor funding impacted positively on community development projects. It was further observed that an increase in donor grants improved success in the implementation of community development projects. Ouma (2012) did an investigation on the factors affecting effective implementation of donor funded projects in Kenya and the results showed that adequate funding and timing of funds were the main factors that greatly contributed towards successful implementation of World Bank funded projects. Mwangi (2013) did an investigation on the link between donor funding and implementation contracting score of state owned enterprises in Kenya and the findings discovered that donor funding was positively linked to implementation contracting score. Donor funding was found to improve implementation contracting score of state-owned corporations.

Mujabi, Otengei, Kasekende and Ntayi (2015) did a study on the determinants of successful implementation of donor-funded projects in Uganda and the results showed that donor funds was a key driver towards successful project implementation. Vu Minh Duc (2011) contends that donor funding contributes towards economic development particularly in the low income countries. A survey by William Easterly and Tobias Pfutz (2008) showed that the major
challenge that faced donor aided projects was fragmentation of donor projects; implying that many recipients had multiple small projects from different donors which led to duplication, this derailed government ministries in most countries that were aid intensive. It was further revealed that sustainability was achieved when funds were released on time since it was easy to gather resources in building organisational and managerial capacity (FAO, 2010).

USAID (2010) showed that the key factors that affected sustainability of donor funded projects included funds, donor policies, local participation and political factors. According to Alan Fowler (2009), official funding for NGOs had increased to support development projects. In spite of this, this official aid had some negative aspects such as NGO autonomy and the method of funding and project aid was not participatory this impacted negatively on successful project implementation.

Gachui (2017) assessed the impact of donor funding on implementation of community development projects in Kenya. An explanatory research design was used and a target population of 1,852 individuals who were members of the 20 water projects. A sample comprising of 330 respondents was chosen with the help of a two-stage sampling technique. The results concluded that donor funding was positively linked to implementation of community development projects. It was also revealed that donor funding was significantly related to community development projects. Analysis of Variance (ANOVA) tests found out that its probability value was less than 5% which implied that the overall model was significant. Coefficient of determination was found to be 83.4% which implied that it was a good predictor. Otengei, Kasekendi and Ntayi (2015) explored the association between donor funding and successful implementation of community projects in Uganda and the results depicted that donor funding contributed towards successful community project implementation. A few cases of inefficiencies and delays were cited that emanated from delays of funds because of bureaucracy involved in disbursement of funds.

Cheboi (2014) did an investigation of the effect of donor funding on project implementation at Kosovo-Mathare Slum. A descriptive research design was adopted in a target population of 42 government ministries in the then coalition government. Regression analysis was used and the results revealed a significant and inverse connection between donor funding and project implementation. A conclusion was drawn showing a negative linear connection between donor funding, debt and project implementation at Kosovo-Mathare slum.
Ouma (2012) studied factors affecting the effective implementation of donor funded projects in Kenya; A case of World Bank. This study adopted a descriptive survey and a sample of 21 World Bank implementing agencies in Kenya. Primary sources of data were gathered using questionnaires and interview guides. Analysis was done using descriptive statistics that included mean and standard deviation. It was found that adequate funding, timing and disbursement of funds, human resource capacity, bureaucracy and social-cultural matters were the key factors that affected implementation of donor funded projects. Keng’ara (2014) explored the effect of disbursement of funds on donor projects implementation in Homabay County. An exploratory design was adopted. Validity of data was conducted through expert examination; it was revealed that delayed receipt of donor funds delayed project implementation. Further, it was discovered that unresolved audit queries led to donor aid suspension and this slowed down the process of project implementation.

2.5 Public Private Partnership on Project Implementation

According to Blagescu and Young (2011) can be defined as a partnership involving two parties who agrees working together in the implementation of a project whereby each party has clear defined roles. South African Institute of International Affairs (2005) describes a Public Private Partnership (PPP) as a contract amongst the public sector and a private party whereby private party assumes financial, operational and technical risk in designing, building and operating a project.

Lee, Keil and Kasi (2012) explain that partnership is a kind of collaboration between the public and the private sector in projects such as construction, management and infrastructural development. PPP unites the public and the private sector so as to work together allowing the public sector to gain from inherent advantages linked to the private sector such as operational efficiency, quality services, reliability and efficient spending of public funds, value addition and risk transfer (Public-Private Infrastructure Advisory Facility, 2011).

In Sub-Saharan Africa, the worth of PPP projects rose from less than 0.1$ billion in 1995 in excess of 4.9$ billion in 2004 (Asian Development Bank, 2010). PPP is regarded as an essential tool for facilitating sectoral goals through several programmes. In accordance to Raman and Bjorkman (2009), PPP is a collaborative kind of association amongst the public and the private sector to offer infrastructural services. Jeffrey (2011) explains that PPP could be a formal kind of collaboration between public sector at national and local governments or bilateral government donors) and the private sector with the objective to deliver
infrastructural services to steer development. Nowadays, PPP is emerging as a critical policy option to many countries as the part of their Millennium development goals (MDGs). A report by KPMG (2009) depicted that PPP could be utilized in enhancing access to energy generating projects and boost efficiency in energy supply especially in developing infrastructure, operations, financing and building capacity. Being in partnership with the private sector provides a huge potential for various benefits to the public sector especially the energy sector. Some of the potential benefits for PPP entail a decline in government spending and improved efficiency in managing energy generating projects.

Raman and Bjorkman (2009) indicate that working in partnership with energy generating projects is an important approach in leveraging technical and management expertise as well as energy transfer that results to improved quality. Further, collaborations can also be utilized to mitigate or allocate risks related to projects. A study by Raman and Bjorkman (2009) did an investigation on the contribution of PPP on implementation of energy generating projects in India and the findings showed that quality between the partners, autonomy between the partners, shared decisions and accountability resulted into project implementation.

Some of the notable constraints for PPP projects include lack of clarity on the use of ppp, political interference, delays for payment, non-revision contracts. Itika, Mashindano and Kessy (2011) studied some of the factors that influenced PPP projects in Tanzania and the results showed that regulatory framework, financial support, commitment by the stakeholders, coordination, human resource capacity and professionalism. It was further concluded that PPP impacted greatly towards successful project implementation.

Gannon-Leary, Baines and Wilson (2009) evaluated the characteristics of PPP projects and their contribution towards successful project implementation. Some of the notable characteristics were included trust, governance structures, mutual respect, shared goals, set objectives, transparency and communication amongst partners, team work and team spirit. All projects whose partners had these traits were successfully implemented. A study carried out by Diba (2012) surveyed critical success factors for PPP projects in Kenyan roads using an exploratory kind of a research design and expert sampling to collect data. Questionnaires were administered for data collection purposes and the results found three important factors: a conducive and stable regulatory framework, realistic costs and benefits and credible and transparent procurement processes. It was further concluded that a good partnership between government and the private sector was a key contributor towards successful project
implementation. Alinaitwe and Ayesiga (2013) did an exploration on the success factors towards implementation of PPP in Uganda’s construction sector. To realize the objective for this study interviews were carried out with three kinds of stakeholders who included the government, management and financial institutions, who were largely involved in construction of public facilities.

The results showed that with a well-organized private sector, competent personnel and good governance construction projects were successfully implemented. However, a well-defined and sound relationship between the public and private sector was a key contributor towards successful project implementation. Mohamed (2015) analysed the factors that affected implementation of PPP projects in Sudan using a survey of 6 essential factors which were legal, risk, efficiency, performance, financial and political environment. A survey monkey questionnaire and hard copies were used to data. It was established that three important factors that had the greatest impact towards implementing PPP projects included PPP support and qualifications and capacity by the contractors and the consultant. Stella (2015) examined the factors that influence funding of ppp projects focusing on infrastructural development of Thika road in Kenya. A survey was conducted and primary data was collected using questionnaires. Data analysis was achieved using descriptive statistics and correlation. Results showed a positive association between funding PPP road projects and implementation of infrastructural development projects.

Other important factors that led to successful implementation of infrastructural projects included efficient procurement procedures.

2.6 Chapter Summary

The chapter has reviewed the literature by several scholars on the effect of financial instruments on implementation of projects. Specifically, the literature has looked at different forms of financing geothermal energy projects and how they affect project implementation. While there are various forms of financing geothermal energy projects, debt and equity are the main forms of financing energy projects and other infrastructural projects. Also, included in this chapter is a summary of all the issues that have been discussed in line with the research objectives. The following chapter focuses on the research methodology that covers the design for this research, population, sampling, methods of collecting data and data analysis.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction
This chapter described the methodology that was adopted to address the research problem. This included the research design, target population, the sampling procedure, data collection methods, validity and reliability, operationalization of variables, data analysis approaches and chapter summary.

3.2 Research Design
Research design is a blueprint that is meant to achieve the set objectives and giving answers to the research questions. It comprises the blueprint for collecting, measuring and analysing of data. It is an arrangement of conditions necessary for collecting and analysing data in a manner that seeks to combine relevance, purpose and procedures (Saunders, Lewis and Thornhill, 2009). The research problem was investigated using a descriptive survey research design. In accordance to Cooper and Schindler (2003), a descriptive study aims at exploring what, where and how about a phenomenon. This approach is common in business research because of its flexibility. It entails a deep investigation of problem solving circumstances whereby problems are considered suitable to the research problem. The study focused on the effect of financing instruments on implementation of geothermal energy projects in Kenya. The study sought to select a number of targeted cases whereby an intensive analysis identified the likely alternatives that were meant to find answers to the research questions for this study (Cooper & Schindler, 2008). Questionnaires were used to collect primary data. These questionnaires were administered using ‘a drop and pick later’ method. The estimated data collection duration was four weeks.

3.3 Population and Sampling Design

3.3.1 Target Population
According to Ngechu (2004) a study population is a well-defined or specified set of individuals, objects, elements or activities to be investigated. The target population for this study included employees who worked for GDC in Kenya. The company was estimated to have 1,080 employees (GDC, 2016).
3.3.2 Sampling Design

This section discussed the sampling frame, sampling techniques and the sample size that was used by the researcher to identify, and select the respondents and determine the sample size.

3.3.2.1 Sampling Frame

A sampling frame is defined as an all-inclusive list of all sampling units whereby a sample can be drawn (Kombo and Tromp, 2006). The sampling frame for this study was derived from the following departments: Projects Management, Planning and Strategy, Finance and Performance Management Departments whereby purposive sampling was used to select the respondents from each department. These respondents were involved directly in decision making particularly on the mode of financing geothermal energy projects.

3.3.2.2 Sampling Technique

A sample is a small portion of a target population. Sampling means selecting a given number of subjects from a defined population as a representative of that population. A stratified sampling technique was used in selecting respondents from different departments in order to get a representative sample. According to Kothari (2006) defines stratification as the process of dividing members of the population into homogeneous subgroups before sampling. The strata were mutually exclusive since every element in the population was assigned to a single stratum.

3.3.2.3 Sample Size

A sample is a representation of the whole population. The reason for using a sample was because it is easy to use unlike studying the whole population. The sample size for this study was 284 respondents and this was computed as shown in Table 3.1. A mathematical formula will be used to determine the sample size. The formula was advanced by Cochran (1975) as follows:

\[ n_0 = \frac{z^2pq}{e^2} \]

Where;

\[ n_0 = \text{Sampling distribution} \]

\[ z = \text{level of confidence according to the standard normal distribution (for a level of confidence of 95%, } z = 1.96,) \]
p = estimated proportion of the population that presents the characteristic (when unknown we use p = 0.5)

q = 1 - p

e = tolerated margin of error (for example we want to know the real proportion within 5%)

\[ n_0 = 1.96^2 \frac{(0.5 \times 0.5)}{0.05^2} \]

\[ n_0 = 384.16 \]

To get a more reduced sample size, this formula is adopted:

N= target population

\[ n = \frac{n_0}{1 + (n_0-1)/N} \]

\[ = \frac{384.16}{1 + (384.16-1)/1080} \]

\[ = 283.56 \]

\[ = 284 \text{ respondents} \]

**Table 3.1: Sample Size**

<table>
<thead>
<tr>
<th>Department</th>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects Management</td>
<td>193</td>
<td>51</td>
</tr>
<tr>
<td>Planning and Strategy</td>
<td>182</td>
<td>48</td>
</tr>
<tr>
<td>Finance</td>
<td>523</td>
<td>137</td>
</tr>
<tr>
<td>Performance Management</td>
<td>182</td>
<td>48</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1080</strong></td>
<td><strong>284</strong></td>
</tr>
</tbody>
</table>
3.4 Data Collection Methods
Survey method of data collection was used in this study. Questionnaires were used to collect primary data. These questionnaires consisted of structured and unstructured questions. Administration of the questionnaires was done by dropping and picking them at an agreed time with the researcher (Kothari, 2006). The decision to choose a survey approach was because it is an efficient and economical method to use in comparison to other methods for example observation. Questionnaires were disseminated through emails to the respondents to give them ample time to verify the accuracy and reliability of the data collected. This was considered to be a cheaper and convenient approach for data collection in areas that were not easily accessible by the researcher. Questionnaires with 5-points Likert Scale were administered to collect data since it was easy for the respondents to use and understand (Mugenda & Mugenda, 2008). Secondary sources of data were obtained from GDC annual reports.

3.5 Research Procedures
The researcher communicated with the supervisor and sought prior arrangements before administering the questionnaires to the respondents. The researcher administered the questionnaires in the company of trained research assistants to the chosen respondents. The questionnaires were administered by dropping and picking them later.

3.6 Data Analysis Methods
The data collected was analysed using descriptive approach to establish the effect of financing instruments on implementation of geothermal energy projects in Kenya. The researcher reviewed and verified the returned questionnaires before processing the data. Quantitative form of data was analysed with the help of SPSS and presented in form of frequencies, percentages, mean and standard deviation. Correlation analysis was carried out to determine the strength of the relationships between financial instruments and implementation of geothermal energy projects. The output was displayed using bar charts, graphs and pie charts. It involved tallying responses, computing percentages of variations in responses as well as describing and interpreting data in line with the research objectives. Content analysis was utilized in analysing qualitative data gathered using unstructured questions.
The study adopted a regression equation to show the relationship between independent variables (debt, equity, donor funding and public private partnership) and the dependent variable (geothermal projects implementation).

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \]

Where:

- \( Y \) = Implementation of geothermal energy projects
- \( X_1 \) = debt
- \( X_2 \) = equity
- \( X_3 \) = donor funding
- \( X_4 \) = public private partnership
- \( \alpha \) = regression constant
- \( \epsilon \) = error term
- \( \beta_1 \beta_2 \ldots \beta_n \) = coefficients of variation

### 3.7 Chapter Summary

Chapter three of this study described the methodology that the researcher adopted to accomplish the objective for this study. The research design was employed to test the link between financial instruments and implementation of geothermal energy Projects in Kenya. The study utilized a survey design. The sample frame was deduced from the respective departments where the selected employees worked. The sample was got with the help of a stratified sampling approach. SPSS was used for data analysis. Chapter four; covered the results and findings; this information was drawn after data collection and analysis.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction
The chapter discusses the results and the findings of this study which were guided by the broad objective of the study which was to establish the effect of financing instruments on implementation of Geothermal Energy Projects in Kenya; Case of GDC Menengai Geothermal Project. Primary sources of data were collected with help of questionnaires. Out of 284 questionnaires that were distributed, 199 were returned successfully. This represents a response rate of 70% which was considered sufficient for representing a whole population. Sekaran (2008) indicated that a response rate of 60% and above from a sample is sufficient to represent a population.

4.2 Background Information
This section provides background information of the respondents and the financing sources of geothermal energy projects. The results are shown below.

4.2.1 Gender of the Respondents
The respondents were requested to indicate their gender. The results are shown in Figure 4.1 below.

Figure 4.1 Gender of the Respondents
The results depicted that majority (60%) of the respondents were male while the rest (40%) were female. This imply that the majority of the employees who worked in projects management, planning and strategy and finance were male may be because of the gender bias.

4.2.2 Age of the Respondents

The respondents were requested to indicate the brackets. The results are shown in Figure 4.2.

![Figure 4.2 Age Bracket of the Respondents](image)

In Figure 4.2, 40% of the respondents were aged between 41 to 50 years, 35% of the respondents were aged between 31-40 years, 20% of the respondents were aged above 50 years while only 5% of the respondents were aged below 30 years. These imply that most of the employees working for geothermal energy projects were aged above 35 years.

4.2.3 Level of Education

The respondents were requested to indicate their level of education. The results are shown in Figure 4.3.
The findings showed that 40% of the respondents had undergraduate degrees, 35% of the respondents had master's degree, and 20% of the respondents had diplomas while only, 5% of the respondents had PhD degrees.

4.2.4 Duration of Service in Your Organisation

The respondents were requested to indicate the duration that they had served in the organisation. The results are shown in Figure 4.4.
The results showed that 40% of the respondents had served for a period between 5-10 years, 25% of the respondents served between 11-15 years, 20% of the respondents had served above 15 years, and 15% respondents served below 5 years. This was an indication that majority of the respondents had an experience of more than 5 years in their work.

4.2.5 Main Sources of Financing Geothermal Energy Projects

The respondents were requested to comment on the main source of financing geothermal energy projects. The results are provided below.

![Figure 4.5 Source of Financing Geothermal Energy Projects](image)

In Figure 4.5, 45% of the respondents agreed that debt, 40% of the respondents indicated equity, 10% of the respondents indicated PPP and only, 5% of the respondents indicated grants. These imply that the main sources of financing geothermal energy projects were debt and equity.

4.2.6 Any other Source of Financing Geothermal Energy Projects

The respondents were requested to indicate whether they were aware of any other source of financing geothermal energy projects. The results are shown in Figure 4.6.
Figure 4.6 Other Sources of Financing Geothermal Energy Projects

The results showed that majority (90%) of the respondents were in agreement that there was no any other source of financing geothermal energy projects; only 10% of the respondents thought that there were other sources of financing.


To what extent does debt as a financing instrument affect implementation of geothermal projects. The results are provided in Table 4.1.
Table 4.1 Debt Financing and Implementation of Geothermal Energy Projects

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt financing is considered a cheaper source of financing GDC energy projects</td>
<td>199</td>
<td>3.74</td>
<td>0.455</td>
</tr>
<tr>
<td>The organisation enjoys an allowable expense for tax through debt interest</td>
<td>199</td>
<td>3.67</td>
<td>0.544</td>
</tr>
<tr>
<td>There is no dilution of control in the organisation when debt is issued.</td>
<td>199</td>
<td>3.65</td>
<td>0.677</td>
</tr>
<tr>
<td>Use of debt enables the organisation to budget and make financial plans since the organisation is cognisant about the interest and principal amount each month</td>
<td>199</td>
<td>3.45</td>
<td>0.705</td>
</tr>
<tr>
<td>Debt financing has improved efficiency in implementation of project (less bureaucracy to access funds)</td>
<td>199</td>
<td>3.85</td>
<td>0.675</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>3.672</td>
<td>0.611</td>
</tr>
</tbody>
</table>

The respondents agreed to a large extent that debt financing: improved efficiency in the implementation of geothermal energy projects, it was regarded as a cheaper source in financing GDC energy projects; it also allowed expense for tax via debt interest and prevented dilution of control in implementation of geothermal energy projects. The mean values are (M= 3.85, M=3.74, M=3.67 and M=3.65, respectively). The respondents further agreed to a moderate extent that use of debt enabled GDC to plan for its finances and allocate budget. The mean value is (M=3.45). The grand mean is 3.672 with a standard deviation of 0.611. This implies that GDC utilized debt to finance geothermal energy projects to a large extent.
4.3.1 Effect of Debt Financing On Implementation of Geothermal Energy Projects

The respondents were asked to indicate the extent to which debt financing affected implementation of geothermal energy projects. The results are provided in Figure 4.7.

![Pie chart showing the distribution of responses to the survey question on the effect of debt financing on implementation of geothermal energy projects. The chart shows the following distribution: Not at all: 25%, Little Extent: 10%, Moderate extent: 5%, Large Extent: 15%, Very Large Extent: 45%.

Figure 4.7 Debt Financing and Implementation of Geothermal Energy Projects

From the findings, 45% of the respondents agreed to a moderate extent, 25% of the respondents agreed to a large extent, 15% of the respondents agreed to a little extent, 10% of the respondents agreed to very large extent and only, 5% of the respondents disagreed (not not at all).

4.4 Effect of Equity Financing on Implementation of Geothermal Energy Projects

The respondents were asked to indicate the level at which equity financing affected implementation of geothermal energy projects. The results are provided in Table 4.2.
Table 4.2 Equity Financing and Implementation of Geothermal Energy Projects

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity financing has improved the speed at which projects are implemented</td>
<td>199</td>
<td>3.79</td>
<td>0.674</td>
</tr>
<tr>
<td>Equity financing has increased the scope of geothermal projects.</td>
<td>199</td>
<td>3.81</td>
<td>0.731</td>
</tr>
<tr>
<td>GDC has full control of the project and decisions and this has improved project efficiency</td>
<td>199</td>
<td>4.10</td>
<td>0.595</td>
</tr>
<tr>
<td>Through equity financing GDC can easily access loan facilities in future</td>
<td>199</td>
<td>3.99</td>
<td>0.575</td>
</tr>
<tr>
<td>With equity financing, outside investors expect organisation to deliver value.</td>
<td>199</td>
<td>3.45</td>
<td>0.679</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>199</strong></td>
<td><strong>3.828</strong></td>
<td><strong>0.651</strong></td>
</tr>
</tbody>
</table>

The respondents agreed to a large extent that the organisation controlled project decisions which led to efficient project implementation, and that equity financing enabled the organisation to easily get loans in future. The mean values include (M=4.10 & M=3.99). Further, the respondents agreed to a large extent that use of equity increased the scope of geothermal projects and enhanced speed at which geothermal projects were implemented. The mean values include (M=3.81 & M=3.79). The respondents agreed to a moderate extent that outside investors expected GDC to deliver value because of utilizing equity to finance geothermal energy projects. The mean value is (M=3.45). The grand mean is 3.823 with a standard deviation of 0.651. This implies that GDC utilized equity to finance geothermal energy projects to a large extent.

4.5 Effect of Donor Funding on Implementation of Geothermal Energy Projects

The respondents were asked to comment on the level at which donor financing affected implementation of geothermal energy project. The results are given in Table 4.3.
Table 4.3 Donor Funding and Implementation of Geothermal Energy Projects

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donor funding has slowed the speed at which projects are implemented</td>
<td>199</td>
<td>3.63</td>
<td>0.571</td>
</tr>
<tr>
<td>Donor funding has limited the scope of the projects</td>
<td>199</td>
<td>3.56</td>
<td>0.691</td>
</tr>
<tr>
<td>Funding allows donor influence on project decisions and this affects project implementation.</td>
<td>199</td>
<td>3.65</td>
<td>0.777</td>
</tr>
<tr>
<td>The quality and delivery of the final product influences future funding and long-term survival of the organisation</td>
<td>199</td>
<td>3.61</td>
<td>0.544</td>
</tr>
<tr>
<td>The organisation has so far met the expectations of the end-users and sponsors</td>
<td>199</td>
<td>3.19</td>
<td>0.635</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>199</td>
<td>3.528</td>
<td>0.644</td>
</tr>
</tbody>
</table>

The respondents agreed to a large extent that donor funding: allowed donor influence on project decisions, delayed project implementation and limited project scope. The mean values are (M=3.65, M=3.63 & M=3.56). The respondents further agreed that the quality of the final product influenced future project funding. The mean value is (M=3.61). The respondents agreed to a moderate extent that GDC had so far met the expectations of the donors in the manner in which it utilizes its donations in implementing geothermal energy projects. The mean value is (M=3.39). The grand mean is 3.728 with a standard deviation of 0.644. This implies that donor funds were utilized by GDC to finance geothermal energy projects to a large extent.

4.6 Effect of PPP on Implementation of Geothermal Energy Project

The respondents were requested to indicate the level at which PPP affected implementation of geothermal energy project. The results are shown in Table 4.4.
Table 4.4 Effect of PPP on Implementation of Geothermal Energy Project

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPP financing has slowed the speed at which geothermal projects are implemented due to bureaucracy</td>
<td>199</td>
<td>2.29</td>
<td>0.711</td>
</tr>
<tr>
<td>PPP financing has limited the scope of the project</td>
<td>199</td>
<td>2.42</td>
<td>0.651</td>
</tr>
<tr>
<td>With PPP many stakeholders are involved in project decisions and this affects project implementation</td>
<td>199</td>
<td>2.51</td>
<td>0.710</td>
</tr>
<tr>
<td>The organisation complies with legal and institutional framework</td>
<td>199</td>
<td>2.45</td>
<td>0.778</td>
</tr>
<tr>
<td>The organisation describes the approaches for capital mobilization, both from the public and private sectors including emergence of infrastructure fund</td>
<td>199</td>
<td>2.05</td>
<td>0.634</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>199</td>
<td>2.344</td>
<td>0.697</td>
</tr>
</tbody>
</table>

The respondents agreed to a moderate extent that stakeholders participated in project decisions and that GDC abided with regulations. The mean values are (M=2.51 & M=2.45). To a little extent, the respondents agreed that use of PPP: limited project scope, it lowered speed to implement geothermal energy projects and that GDC described the methods for capitalization for both public and private sectors. The mean values are (M=2.42, M=2.29 & M=2.05). The grand mean is 2.344 and with a standard deviation of 0.697. This implies that GDC utilized PPP to finance geothermal energy projects to a little extent.

4.7 Implementation of Geothermal Energy Projects

The respondents were requested to indicate the level of implementation of geothermal energy projects. The results are outlined in Table 4.5.
The respondents agreed that to a moderate extent that geothermal energy project targets were achieved, resources and budgets were utilized properly and project standards were kept. The mean values were as follows (M=3.15, M=3.09, M=2.80 & M=2.62). To a little extent the respondents indicated that the deadlines for projects were adhered to (M=2.43). The grand mean was 2.818 with a standard deviation of 0.643. This implies that GDC implemented geothermal energy projects to a moderate extent.

4.8 Pearson Correlation Analysis

Pearson correlation coefficient was used to measure the linear relationship between financing instrument (independent variable) and the dependent variable (implementation of geothermal energy projects). The results are provided in Table 4.6.
Table 4.6 Correlation Coefficient

<table>
<thead>
<tr>
<th></th>
<th>Implementation of geothermal projects</th>
<th>Debt</th>
<th>Equity</th>
<th>Donor Funding</th>
<th>PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of geothermal projects</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt</td>
<td>0.775**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td>0.678**</td>
<td>0.762**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor funding</td>
<td>0.556**</td>
<td>0.385**</td>
<td>0.472**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PPP</td>
<td>0.451**</td>
<td>0.197</td>
<td>0.251</td>
<td>0.098</td>
<td>1</td>
</tr>
</tbody>
</table>

Correlation between debt and implementation of geothermal energy projects recorded a positive correlation coefficient of 0.775. These imply that there was a strong correlation between debt and implementation. Use of debt as a financing tool enhanced implementation of geothermal energy projects. Equity and implementation of geothermal energy projects recorded a positive correlation of 0.678. This is an indication that there existed a moderately strong correlation amidst equity and implementation. Donor funding and implementation of geothermal energy projects recorded a positive correlation of 0.556, which implied that there was a weak correlation between donor funding and implementation of geothermal energy projects. PPP and implementation of geothermal energy projects recorded a correlation of 0.451. These imply that there was a weak correlation between PPP and implementation. It can be deduced that use of debt as a financing instrument contributed greatly towards successful implementation of geothermal energy projects followed by equity and then donor funding while PPP recorded the least effect on implementation of geothermal energy projects.


To establish the link between financing instruments and implementation of geothermal energy projects, a regression equation was adopted.
In Table 4.6, the coefficient of determination was 0.467 implying that financial instruments explained 46.7% variations in implementation of geothermal energy projects.

In Table 4.7, it was found that the regression equation adopted for this study was significant since it has predictive values. P-value was smaller than 5%, 0.000.

In Table 4.8, the model coefficients are presented with the following variables: (Constant), debt, equity, PPP, donor funding.
The regression model derived from this study was follows:

\[ \text{Implementation} = 0.172 + 0.013X_1 + 0.073X_2 - 0.018X_3 + \varepsilon \]

Where \( Y = \) Implementation of geothermal energy projects

\[ X_1 = \text{Debt} \]
\[ X_2 = \text{Equity} \]
\[ X_3 = \text{PPP} \]
\[ \varepsilon = \text{Error term.} \]

PPP was omitted from the regression equation since its probability value surpassed 5%, 0.523. Debt, equity and donor funding were significant as their probability values were lower than 5% (0.000, 0.014 & 0.005, respectively). Debt and equity were positively linked to implementation of geothermal energy projects as shown by the coefficient values (0.013 & 0.073, respectively). Donor funding and PPP were negatively linked to implementation of geothermal energy projects (-0.018 & -0.020, respectively).

4.9 Chapter Summary

This chapter has presented the interpreted results and findings. The first section provided an analysis of the various demographics data on the respondents. The remaining four sections analysed the findings on the effect of financing instruments on the implementation of geothermal energy projects in Kenya as per the objectives. Chapter five will summarise the study by highlighting the discussions, conclusion and finally the recommendations of the study.
CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction
The main purpose of this study was to establish the effect of financing instruments on implementation of geothermal energy projects in Kenya particularly GDC Menengai geothermal project. The study sought find answers to the following: the effect of debt on geothermal energy projects implementation, the effect of equity on geothermal energy projects implementation, the effect of donor funding on geothermal energy projects implementation and the effect of PPP on geothermal energy projects implementation. Primary data was collected using questionnaires. A response rate of 70% was achieved and considered a sufficient representation of the entire population.

5.2 Summary of the Study
The main objective of this study was to establish the effect of financial instruments on implementation of geothermal energy projects in Kenya. The following objectives were used to guide the study to its completion: To establish the effect of debt financing on implementation of geothermal energy projects in Kenya.; To examine the effect of equity financing on implementation of geothermal energy projects in Kenya; To determine the effect of donor financing on implementation of geothermal energy projects in Kenya; To establish the effect of public private partnership on geothermal energy projects in Kenya.

The study utilized a descriptive research design and questionnaires were used as data collection tool. The target population was 1080 employees of Geothermal Development Company (GDC). Using the sample formula, as sample of 284 respondents was drawn out. The data was then analysed using both descriptive and stratified sampling approach by use of SPSS for data analysis.

For the analysis of the first objective it was established that most of the respondents agreed to a large extent that debt financing improved efficiency in the implementation of geothermal energy projects. It was also found that it was the cheaper source of financing GDC energy projects. In addition, the findings also revealed that to a moderate extent that the use of debt enabled GDC to plan for its finances and allocate its budget.
For the analysis of the second objective, it was established that most of the respondents agreed that to a large extent that the organization controlled project decisions which led to efficient project implementation and that equity financing enabled the organization to easily get loans in future. Further, the respondents agreed to a large extent that use of equity increased the scope of geothermal projects and enhanced speed at which geothermal projects were implemented.

For the analysis of the third objective, it was established that the respondents agreed to a large extent that donor funding allowed donor influence on project decisions, delayed project implementation and limited project scope. In addition, the respondents agreed that the quality of the final product influenced future project funding.

For the analysis of the fourth objective, it was established that the respondents agreed that to a moderate extent that stakeholders participated in project decisions and that GDC abided with the regulations. To a little extent the respondents agreed that the use of PPP limited project scope, lowered speed to implement geothermal energy projects and that GDC described the methods for capitalization for both public and private sectors.

5.3 Discussions

5.3.1 Effect of Debt on Implementation of Geothermal Energy Projects

The study found that most of the respondents agreed to a large extent that debt financing improved efficiency in the implementation of geothermal energy projects. It was also found that it was the cheaper source of financing GDC energy projects. In addition, the findings also revealed that to a moderate extent that the use of debt enabled GDC to plan for its finances and allocate its budget.

The study also established that debt was relatively cheaper than other options of financing such as equity hence a commonly used tool to finance geothermal projects. Although some respondents pointed out that use of debt led to an increase in the cost of financing, it enhanced efficiency due to less bureaucracy in accessing funds and enabled the organisation to have full control of geothermal energy projects. In line with this, a significant relationship was found between debt and implementation of geothermal energy projects in Kenya.

The study noted that it was strongly agreed that geothermal development was a capital intensive project. This was in tandem with past observations in a study conducted by in
Kenya by Ngugi (2014). Ngugi had noted that geothermal projects are capital intensive in that large sums of money are required for their implementation. It was further agreed that long-term debt was necessary for GDC growth, the Government of Kenya was often involved when borrowing money and that financial institutions helped in bridging the financing gap thus leading to the growth of GDC. The foregoing findings concurred with the observations made in a study by Audinet and Fridrikson (2015) that long-term loans were low-cost and as such were suitable for exploration, drilling, steam field development and power plant construction.

The study further revealed that firms lower their risk profiles by adopting a project finance where other investors particularly lenders/ creditors are invited to share profits and bear some of the project risks. It was further established that most of the countries whose interest arise from debt is a deductible expense for income tax purposes hence provides a price advantage also known as tax shield. these countries get this debt from both local and international commercial banks, bilateral and multilateral cooperation’s, stock markets and even pensions. In addition to that, long term cost of government infrastructures bonds are slightly cheaper in the long run.

The study further established that the GDC adhered to the funding conditions instituted by financial institutions, and that cost of capital was considered when borrowing money. From the findings, financial institutions greatly influence the growth of GDC through provision of long term loans. The study underlined the importance of long-term loans in respect to the growth of the GDC. (Paul, K 2012)

5.3.2 Effect of Equity on Implementation of Geothermal Energy Projects

The study established that most of the respondents agreed that to a large extent that the organization controlled project decisions which led to efficient project implementation and that equity financing enabled the organization to easily get loans in future. Further, the respondents agreed to a large extent that use of equity increased the scope of geothermal projects and enhanced speed at which geothermal projects were implemented.

Equity was also found to be a popular financing tool used by the organisation. The respondents indicated that equity financing enhanced efficiency in projects implementation, scope of geothermal projects and gave the organisation full control on project decisions. With equity financing, it was easier for the organisation to easily access loan facility in future.
Equity was found to have a positive and significant connection with implementation of geothermal energy projects in Kenya.

The study further revealed that equity was not the best mode of funding since the investors expect their return in form of dividends and they do not consider the risks involved. For instance in Kenya the expected rate of return on investment in equity is basically 15% by the government but the private investors need 18-23% return in equity hence making it difficult to fully cover the initial cost within a shorter period of time.

It further revealed that decision making process would be made slower and losing control over the project to the investors would be inevitable. This is because when making any major decision the whole investors would need to be notified by holding AGMs to vote against or for the idea which can further lead to conflict amongst the investors. These factors would lead to equity taking a long time on return in investment over debt.

The research also established that private sector funding and participation in clean energy projects is a challenge for many reasons. One of these is that the host government is often the only buyer of the electricity i.e. it is the so called offtake purchaser. Many developing countries with large clean energy potential have limited creditworthiness. They have low per capita income and are often going through economic and political transition. In these cases the sponsors of a project might hesitate to fund the project because of uncertainty with the income stream from the investment made. Lenders, including commercial investment banks, would also often hesitate to provide loans to such projects because of uncertainty whether the project company, whose income stream is at risk, can service its loans. (Ruth, S. 2014)

5.3.3 Effect of Donor Funding on Implementation of Geothermal Energy Projects

It was observed that donor funding led to inefficiencies in geothermal projects implementation, it also limited the project scope and weakened the organisation’s control on project decisions. This contributed negatively on the implementation of geothermal projects. The regression results showed a negative and insignificant relationship amidst donor funding and implementation of geothermal projects in Kenya.

The study revealed that the Geothermal Development Company had benefited from donor funding from financial institutions. It was also observed that the firm prepared and submitted
proposals for funds, and also that donor financing helped to fill in the financial gap in the company. The study further revealed that donor funds supported high risk exploration activities, GDC prepared compliance reports on the use of those funds, and also that donor funds support was very limited.

The study revealed that donor coordination in case where different donors from various donor agencies come together to aid the geothermal development, the chances of them to succeed or fail is divided since no donor has much at stake in the recipient country. They thus need visible aid results clearly attributable to the donor’s activities, even if the geothermal development impact of the development budget is thereby reduced. Coordination of donors’ goals, if possible, would reduce these problems and increase the overall development impact of aid, even if donors then act separately (Svensson, 2000).

Donor alignment with the receiving country is also key in the implementation of geothermal development (Azam & Laffont, 2000). The utility functions of the donors are assumed to have two elements, consumption at home and consumption of the poor in the aid-receiving country. If one donor provides aid, it has a positive effect on the welfare of all donors. Non-cooperation in such a situation leads to an undersupply of aid (the common goods problem), and cooperation is thus desirable (Torsvik, 2005).

From the research findings, GDC employees agreed the donor financing influences the implementation and growth of the company. The study indicated the importance of donor financing in propelling the organizational growth of the GDC. The study observed that donor funds from governments could be used to cover the cost of preliminary surveys and surface exploration or to reduce exploration drilling risks for private developers. It was further revealed that donor funds that are cost free funds are very limited. While there are many institutions that provide grants, they are mainly limited to less than 2 million Euros and hardly ever greater than 5 million Euros.

Donor funds are also limited in their application with the providing entity dictating their use. Most of the funds are aimed at capacity development, technical assistance in studies and provision of specialized skills. The application process for the donor funds is very intensive and generates great competition thus limiting chances of obtaining them. However, if obtained they fill gaps that help drive projects forward as supported in an earlier study by Okumu 2003. (Ouma, D. 2012)
5.3. 3 Effect of PPP on Implementation of Geothermal Energy Projects

The study established that the respondents agreed that to a moderate extent that stakeholders participated in project decisions and that GDC abided with the regulations. To a little extent the respondents agreed that the use of PPP limited project scope, lowered speed to implement geothermal energy projects and that GDC described the methods for capitalization for both public and private sectors.

The study found that PPP financing led to inefficiencies in implementation of geothermal projects, it also limited the scope of projects and diluted full control of the project by the organisation. The respondents reported that use PPP impacted negatively on geothermal project implementation. A negative and significant relationship was found between PPP and implementation of geothermal energy projects in Kenya.

The study revealed that PPP becomes a venue for the public and private sectors to cooperate on a project that would traditionally have been in the public domain. In a PPP arrangement, the project is transferred back to the government when the concession agreement ends. PPPs have since played a limited role in establishment of geothermal projects despite its potential for balancing risks across different stakeholders and attracting additional private investment. (OECD, 2008). In this situation efficient and effective risk allocation is key to the success of the project and the international community can play a constructive role

The study revealed that PPPs are one platform worth considering for the private sector to engage in infrastructure projects. Private capital, donor support and public funds can be combined in a PPP project. A well designed policy and institutional framework for PPPs offers the opportunity to leverage and combine all three sources of financing and expertise without crowding out private investment. By forming a PPP both public and private sectors can share the risks and rewards of infrastructure projects.

The study also revealed that PPP participation can help projects in developing countries in two ways: (1) making them more commercially viable through, for example, better finance, improved risk mitigation, advice; and (2) improving their developmental outcomes by, for example, providing the advice and standard setting that lead to better operations, products, and services; stronger environmental, social, and corporate governance activities; or projects that are more inclusive (IFC, 2011). For this success to be achieved that depends on a number of factors such as the government fiscal situation, preference for the private level
participation of a project, desired level of vertical integration of the geothermal development and community involvement in the development of the project. If private sector financing is engaged the cost of capital need to be carefully considered as the financiers may require a high premium for the risk involved (Magnus, G 2012). PPPs also tend to provide finance with longer maturities, which is generally beyond the risk appetite of private capital (IFC, 2011).

5.4 Conclusion

The most popular financing instruments used by GDC are debt and equity. These sources of finance have less bureaucracy or no bureaucracy at all, they allow the organisation to enjoy full control of the project decisions and they do not limit the scope of geothermal energy projects. Thus, they contribute effectively towards implementation of geothermal projects.

5.4.1 Effect of Debit Financing on Implementation of Geothermal Energy Projects

GDC mainly used debt to finance geothermal energy projects. Debt financing increased cost of financing geothermal energy projects, however, GDC benefitted from tax deductions, improved efficiency and control of geothermal energy projects. A positive and significant connection was found to exist between debt and implementation of geothermal energy projects in Kenya.

5.4.2 Effect of Equity Financing on Implementation of Geothermal Energy Projects

Equity was frequently used by GDC as a financing instrument. It was the cheapest financing tool since it was obtained from internally generated funds. There was improved efficiency in accessing funds due to reduced bureaucracy and full control by GDC in key decisions regarding implementation of geothermal energy projects. Equity was positively and significantly related to implementation of geothermal energy projects in Kenya.

5.4.3 Effect of Donor Funding on Implementation of Geothermal Energy Projects

It was observed that donor funding led to inefficiencies in geothermal projects implementation, it also limited the project scope and weakened the organisation’s control on project decisions. This contributed negatively on the implementation of geothermal projects. The regression results showed a negative and insignificant relationship amidst donor funding and implementation of geothermal projects in Kenya.
5.4.4 Effect of PPP on Implementation of Geothermal Energy Projects

The study found that PPP financing led to inefficiencies in implementation of geothermal projects, it also limited the scope of projects and diluted full control of the project by the organisation. The respondents reported that use PPP impacted negatively on geothermal project implementation. A negative and significant relationship was found between PPP and implementation of geothermal energy projects in Kenya.

5.5 Recommendations

5.5.1 Recommendations for Improvement

5.5.1.1 Effect of Debit Financing on Implementation of Geothermal Energy Projects

From the findings, use of debt is significantly linked to geothermal projects implementation. This is because use of debt makes the organisation more responsible and committed to pay interest, thus the organisation tries to minimize operational costs. As long as use of debt does not threaten the financial health of an organisation in difficult times, an organisation can consider using debt to boost their investment returns and to benefit from interest deductions through minimization of an organisation’s taxes.

5.5.1.2 Effect of Equity Financing on Implementation of Geothermal Energy Projects

The study recommends that GDC should consider using internal funds to finance their projects if these funds are available. Use of internal funds allows the organisation to have a complete control of its business unlike diluting control to other investors whose interests might be different from organisational goals. Moreover it mitigates your overhead costs and boosts your profit margins. An organisation that uses equity tends to be more attractive to potential investors since lower debt enhances the creditworthiness of an organisation.

5.5.1.3 Effect of Donor Funding on Implementation of Geothermal Energy Projects

The findings depicted some inefficiency in geothermal projects implementation as it limited the project scope and weakened the organizations control on project decisions. The study recommends that the organization should strive to use more of its internal resources of available so as to gain overall control and decision making powers for its projects. The study also recommends that the government needs to organize and create proper channels on how to understand and appreciate donor funding procedures available in the country.
5.5.1.4 Effect of PPP on Implementation of Geothermal Energy Projects

The findings showed an insignificant relationship between PPP financing and geothermal energy projects implementation. Use of PPP can turn out to be risky due to complexity and inefficiencies involved in procurement procedures. Secondly, PPP projects contracts are long-term, complex and relatively inflexible due to difficulties involved in forecasting and evaluating events that may impact future activities. Finally, it is worthwhile to note that when the expertise in the partnership heavily lies with the private sector, the government might stand to lose since they might not be able to assess accurately the proposed costs.

5.5.2 Recommendation for further studies

It is recommended that studies be carried out on other financial factors influencing the implementation of geothermal projects and growth of the Geothermal Development Company in Kenya. It is also recommendable to conduct studies on the implication of other forms of loans (short-term and medium-term loans) on the growth of GDC. The study also recommends a comparative empirical study to be conducted on the influence of both local and international financing on the growth of the GDC. A similar study should also be conducted on the effect of debt, equity and donor funds on the implementation of geothermal projects and growth of the GDC.
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Western Asset (2012). *Investment in Infrastructure Debt*


Dear Respondent,

**RE: REQUEST FOR PARTICIPATION IN RESEARCH WORK**

I am a Masters student at United States International University pursuing an (MBA) with a concentration in Finance and Strategic Management. In partial fulfilment of the requirement for the degree, I am conducting a research on “effect of financing instruments on the implementation of geothermal energy projects in Kenya; case study of GDC.”

I shall be grateful if you kindly complete the enclosed questionnaire to be used to collect the data applicable to my research. Any contributions are essential for the achievement of this research. The results will be used only for academic purposes. In case of any queries during completing the enclosed questionnaire, contact me at any time via my contact furnished at the top of this letter.

Thank you in advance,

Yours sincerely,

Sandra C. Soy
APPENDIX II: QUESTIONNAIRE

Section A. Demographic Information

1. Position of the respondent…………………………………………………

2. Sex of the Respondents
   i. Male ☐
   ii. Female ☐

3. Age of Respondents
   i. Below 30 years ☐
   ii. 31 to 40 years ☐
   iii. 41 to 50 years ☐
   iv. Above 50 years ☐

4. Level of Education
   i. PhD Degree ☐
   ii. Master’s Degree ☐
   iii. Undergraduate Degree ☐
   iv. Diploma ☐

5. Duration of service in your organisation
   i. Below 5 years ☐
   ii. 5-10 years ☐
   iii. 11-15 years ☐
iv. Above 15 years □

6. What is the main source of financing geothermal energy projects in your organisation?
   i. Debt □
   ii. Equity □
   iii. Grants □
   iv. Public private partnership □

7. Are you aware of any other source of financing used to finance geothermal energy projects in your organisation?
   Yes □
   No □

8. If yes, which one(s)?

Specify
......................................................................................................................................................
......................................................................................................................................................
......................................................................................................................................................
......................................................................................................................................................
Section B: Effect of Debt Financing on Implementation of Menengai Geothermal Energy Project

9. To what extent does debt as a financing instrument affect implementation of geothermal projects?

1-Not at all. 2- Little extent. 3- Moderate extent. 4- Large extent. 5-Very large extent.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Debt financing is considered a cheaper source of financing GDC energy projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The organisation enjoys an allowable expense for tax through debt interest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. There is no dilution of control in the organisation when debt is issued.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Use of debt enables the organisation to budget and make financial plans since the organisation is cognizant about the interest and principal amount each month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Debt financing has improved the efficiency in implementation of project (less bureaucracy to access funds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. In general, please indicate the extent to which debt financing has affected implementation of geothermal projects.

- Not at all  □
- Little Extent  □
- Moderate extent  □
- Large Extent  □
- Very Large Extent  □
Section C: Effect of Equity Financing on Implementation of Menengai Geothermal Energy Project

11. To what extent does equity as a financing instrument affect implementation geothermal energy projects?

1-Not at all. 2- Little extent. 3- Moderate extent. 4- Large extent. 5- Very large extent.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Equity financing has improved the speed at which projects are implemented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Equity financing has increased the scope of geothermal projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 The organisation has full control of the project and decisions and this has improved project efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Through equity financing organisation can easily access loan facilities in future</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 With equity financing, the organisation has no loan to repay/less burden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section D: Effect of Donor Funding on Implementation of Menengai Geothermal Energy Project

12. To what extent does donor as a financing instrument affect implementation of geothermal energy projects?

1-Not at all. 2- Little extent. 3- Moderate extent. 4- Large extent. 5- Very large extent.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Donor funding has slowed the speed at which projects are implemented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Donor funding has limited the scope of the projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Funding allows donor influence on project decisions and this affects project implementation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 The quality and delivery of the final product influences future funding and long-term survival of the organisation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 The organisation has so far met the expectations of the end-users and sponsors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section E. Effect of PPP on Implementation of Geothermal Energy Projects

13. To what extent does public private partnership as a financing instrument affect implementation of geothermal energy projects?

1-Not at all 2- Little extent 3- Moderate extent 4- Large extent 5- Very large extent

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PPP financing has slowed the speed at which geothermal projects are implemented due to bureaucracy</td>
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<td>2. PPP financing has limited the scope of the project</td>
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<td>3. PPP financing allows stakeholder involvement and this affects its project implementation.</td>
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<td>4. All the stakeholders (PPP) have similar goals implementing geothermal energy project</td>
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<td>5. The organisation complies with legal and institutional framework</td>
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<td>6. The organisation describes the approaches for capital mobilization, both from the public and private sectors including emergence of infrastructure fund</td>
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Section F. Implementation of Geothermal Energy Projects

12. Please indicate the extent to which you agree with the following statements on implementation of geothermal energy projects.

Tick appropriately. 1-Not at all 2- Little extent 3- Moderate extent 4- Large extent 5- Very large extent

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
<th>2</th>
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<th>5</th>
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</thead>
<tbody>
<tr>
<td>1. The budgets are utilized effectively</td>
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<td>2. The project deadlines are adhered to</td>
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<tr>
<td>3. The resources are appropriately utilized</td>
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<td>4. The project targets are achieved</td>
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<td>5. The project standards are maintained</td>
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</table>

Thank you for taking your time to fill in the questionnaires out of your busy schedules